experimentally. Physical and mathematical scientists also need an introduction to the granting systems in biology, by being guided through the grants and institutional databases other information at the NIH, NSF, DOE Office of Science, and foundations.

1064-Pos Board B850
A Simple Biophysical Experiment to Introduce Ratiometric Measurements and Microplate Fluorimetry in the Laboratory Class
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In the past decades fluorescence applications in the Life Sciences, Sensing and Nanotechnology had a huge burst, in part because a variety of instruments can be used to measure fluorescence, including fluorescence microscopes, flow cytometers, and high throughout microplate readers. Therefore, it is important to introduce students to different apparatus, underlying their common features and particularities.
In many instruments, several experimental limitations hamper quantitative treatment of data, unless ratiometric measurements are made, i.e., the ratio of intensity at two different excitation and/or emission wavelengths, which eliminates a considerable number of artifacts. However, such methods are possible only when a spectral shift occurs.
The denaturation of proteins often induces a blue-shift of the tryptophan residues emission, due to their increased exposure to the polar aqueous medium. Such shift permits the use of ratiometric measures to obtain the fraction of native and denatured protein, hence the denaturation curve.
In this work, the denaturation of egg-hen-lisozyme by guanidine hydrochloride is studied. Since this process has been described by a two-state model, the analysis is straightforward. The students perform single-wavelength and ratiometric measurements, to observe the improvements brought by the latter. The experiment requires just the preparation of a series of solutions with protein and growing concentration of denaturant and respective blanks. With a 96-well plate it is possible to analyze 3-independent series of samples and test the reversibility of the process. From the denaturation curve, the students retrieve the free energy of lisozyme denaturation in water, and the cooperativity of the process. This work is performed successfully (Biochemistry Master Program), and the students reveal development of analytical skills and simultaneously deeper understanding of the physical-chemical principles behind protein structural changes.
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A Simple Device to Illustrate the Einthoven Triangle
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Objective: Einthoven's Triangle is a crucial concept for the proper understanding of electrocardiography but the electrical vector of the heart is often difficult for students to grasp. In order to illustrate this principle, we constructed a device that simulates the ECG orientation and frontal plane vectors to simulate the heart's electrical activity for the main electrocardiographic leads (I, II and III). **Materials & Methods:** We built a box connected to a headboard with three analog voltmeters and a battery that simulates the electrical activity of the heart. Placed on the top of the box is an acrylic board with a diagram of the Einthoven Triangle, consisting of an equilateral triangle with an inscribed concentric circle. The voltmeters were connected to the corners of the triangle, mirroring the standard ECG leads. Silver-chlorided electrodes were placed at the center and at twelve equally spaced positions (30 degrees apart) along the circle. All electrodes were electrically ''connected'' by submergence in a 10 mM saline solution (NaCl). A particular position of the heart's electrical vector was simulated by connecting the negative terminal of the battery to the center of the circle and the positive terminal to an electrode along the circumference. At every position, readings from meters I, II and III were taken. We built a total of six devices for a class of thirty students and tested them in the HPH 400 Human Physiology course at the UC Davis School of Medicine. **Conclusions:** This device enabled students to verify the Einthoven Triangle principle; namely, that Lead I + Lead III = Lead II, independent of the heart's electrical vector position. Combined with the traditional demonstration with ECG machines, this equipment helps medical students to obtain a solid foundation of the basic principles of electrocardiography.

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Building a Community of Practice: Lessons from the Biophysical Society's Summer Short Course
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Between 2008 and 2011 approximately twelve young scientists mainly from schools with underdeveloped biophysics programs have come together at UNC-CH to experience an intensive ''first taste'' of graduate level biophysical research. The curriculum involves lectures, research, seminars, social activities, and an annual reunion with members of previous cohorts returning to share experiences and insights. An initial goal of this project was that the seeds of a network of young underrepresented research scientists would be planted. In fact, the results have exceeded expectation with the participants forming a Community of Practice (CoP), a ''community that acts as a living curriculum for the apprentice'' (Wenger, 2006), in this case, the young researchers. The combined group demonstrates all the characteristics of a CoP, (i) Identity defined by a shared domain of interest and therefore a shared competence that distinguishes members from other people -they value their collective competence and learn from each other, even though few people outside the group may value or even recognize their expertise; (ii) Community of members who interact and engage in shared activities, help each other, and share information with each other. They build relationships that enable them to learn from each other; (iii) Members are practitioners. They develop a shared repertoire of resources which can include stories, helpful tools, experiences, stories, and ways of handling typical problems. As a result of the development of this sense of support and belonging in a CoP comprised of faculty and fellow Biophysics Summer Course alums of 26 eligible for grad school in January 2011, 18 were in grad school (69%) and of these, 16 were pursuing biomedical research degrees (89%). This paper explores the activities and inputs that have aided in the formation of this biophysics CoP.

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Biophysics in Informal Learning Opportunities: Sharing Literacy through Science Communication
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Science and society interrelate in many ways, and consequently, science communication exists between people in any relation in any situation. In this context, informal learning can be regarded as part of science communication that occurs outside of a classroom when educators communicate to educatees on a particular topic. Both parties can include anyone in society; for example, at science centers or museums, adults enjoy these learning opportunities through interaction with staff curators or science communicators.
Science festivals are full of such science communication opportunities. Scientists at any career stage, including graduate students, are often expected to contribute as speakers or panelists, sometimes as ''teachers'' and sometimes as ''storytellers'' about topics of interest for the audience. They benefit from hearing about community needs and expectations as well as increasing their own communication skills. They may also be asked to join public dialogue held at such festivals, where the potential impact of a certain research field is seriously discussed, both as an expert on the scientific side of the subject and as an individual citizen in the community.
This presentation will introduce Japan's representative science festivals with emphasis on examples related to biophysics disciplines demonstrated in those event settings. Also introduced will be positive effects of participating in such multifaceted events for institutions and researchers themselves. Moreover, with empirical evidence and experience as an organizer of an annual nationwide festival, I would like to suggest possible contribution beyond traditional science outreach or popularization, setting one of the goals of informal learning as sharing literacy among all the community members: scientific literacy for nonscientists and social literacy for scientists.